

Portland Harbor Source Control

Stormwater Pathway Evaluation

June 30, 2015
DEQ NWR

Stormwater in JSCS Section 5

Source Control Measure **Example 4- Storm Water Management**

Storm water collection and discharge systems may be a significant pathway for contaminant discharges to Portland Harbor. Source control measures to address this pathway may include, but are not limited to:

- Implementation of BMPs to prevent material from entering the system;
- Removal or capping of contaminated surface soils;
- Storm water conveyance system upgrades and maintenance;
- Control of contaminant discharges to the river through treatment such as installation of oil-water separators; or
- Period catch basin cleaning and conveyance line flushing.

Best management practices should be used to address contaminant releases to the Willamette River from storm water discharges from Portland Harbor sites. Typical BMPs include, but are not limited to the following:

- Frequent sweepings to reduce the release of suspended solids that may have contaminants sorbed to them;
- Installation of drip pans;
- Regular cleaning of catch basins;
- Placement of erosion control devices around catch basins;
- Installation of secondary containment systems around hazardous material storage; and
- Management areas or other waste management activities.

JSCS W-o-E eval to determine if more aggressive sw measures required

The weight-of-evidence evaluation should include the following site-specific factors:

- Identification and characterization (*e.g., type of release, area of release, size of release, age of release*) of potential sources of contaminants;
- Magnitude of storm water and storm water sediment exceedance at each sampling point and proximity of sampling point to the river;
- Regional background soil concentrations of naturally occurring chemicals (*i.e., metals*) for evaluating storm water sediment;
- Presence of bioaccumulative chemicals;
- Site hydrology including consideration of but not limited to the following:
 - o Site conditions (*e.g., land use, surface conditions, topography*);
 - o Size of drainage (*e.g., outfall*) basin; and
 - o Location and estimated size of discharge (river bank; direct to river);
- Storm water system design (*e.g., catch basin design and effectiveness*) and management (*e.g., BMPs, storm water management plan*);
- Maintenance and condition of conveyance system (*e.g., frequency of catch basin and conveyance line cleanout*);



JSCS Appendix D: Framework for Stormwater Evaluations

- Site Info – history, CoCs, storm system, current BMPs
- CB/line solids and Stormwater sampling design
- Screening evaluation
- Reporting
- References



State of Oregon
Department of
Environmental
Quality

Guidance for Evaluating the Stormwater Pathway at Upland Sites

Oregon Department of Environmental Quality
Environmental Cleanup Program

811 SW Sixth Avenue
Portland, OR 97204

January 2009
Updated October 2010

Figure 1: Overview of a Stormwater Pathway Evaluation

DEQ may ask a Responsible Party (RP) to conduct a stormwater evaluation when there is evidence that the release or threat of release of hazardous substances from the site to a waterbody via the stormwater system may contribute to an accumulation of contaminants in sediment, water column or aquatic biota that exceed acceptable risk levels.

Step #1: RP develops Stormwater Assessment Workplan (Section 4) and submits to DEQ for approval



Step #2: RP implements approved sampling plan and submits data reports to DEQ



Step #3: Evaluate sampling data and other information to determine the need for source control measures (Sections 5 & 6)

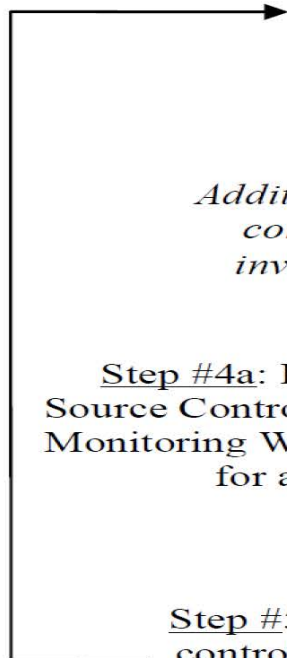
Additional stormwater source control measures and/or investigations are needed



Step #4a: RP develops a Stormwater Source Control Measures and Performance Monitoring Workplan and submits to DEQ for approval (Section 7)



Step #5: RP implements source control measures and conducts performance monitoring



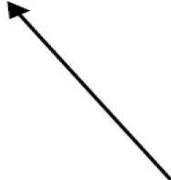
Source control has been achieved



Step #4b: RP prepares a Stormwater Source Control Evaluation Report and submits to DEQ for approval (Section 9)



DEQ determines additional source control measures are needed (Sections 5 & 6)

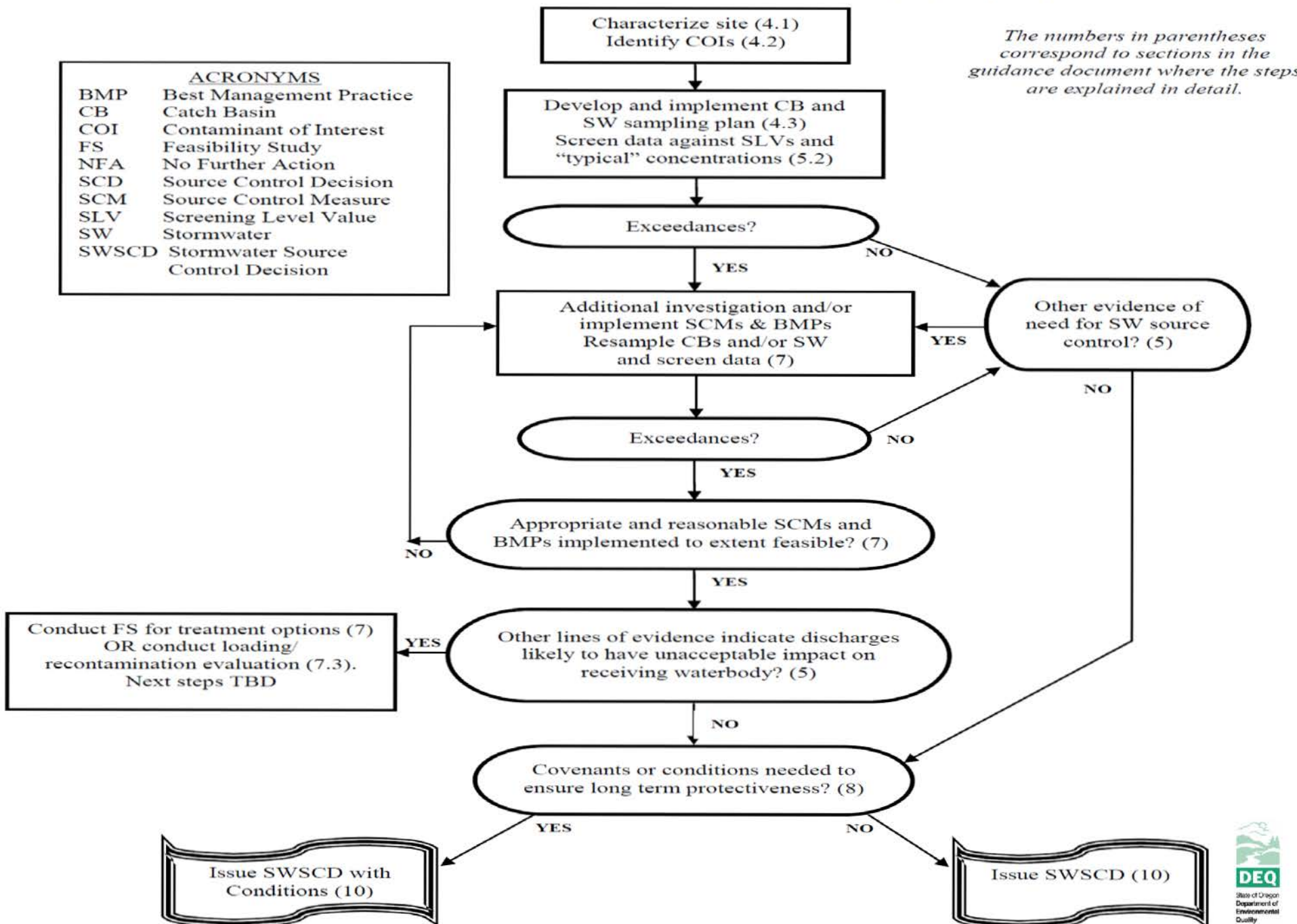


Upon approval of the report, DEQ issues a Stormwater Source Control Decision

FIGURE 2: STORMWATER PATHWAY EVALUATION PROCESS

ACRONYMS	
BMP	Best Management Practice
CB	Catch Basin
COI	Contaminant of Interest
FS	Feasibility Study
NFA	No Further Action
SCD	Source Control Decision
SCM	Source Control Measure
SLV	Screening Level Value
SW	Stormwater
SWSCD	Stormwater Source Control Decision

The numbers in parentheses correspond to sections in the guidance document where the steps are explained in detail.





Storm Event Criteria and Selection

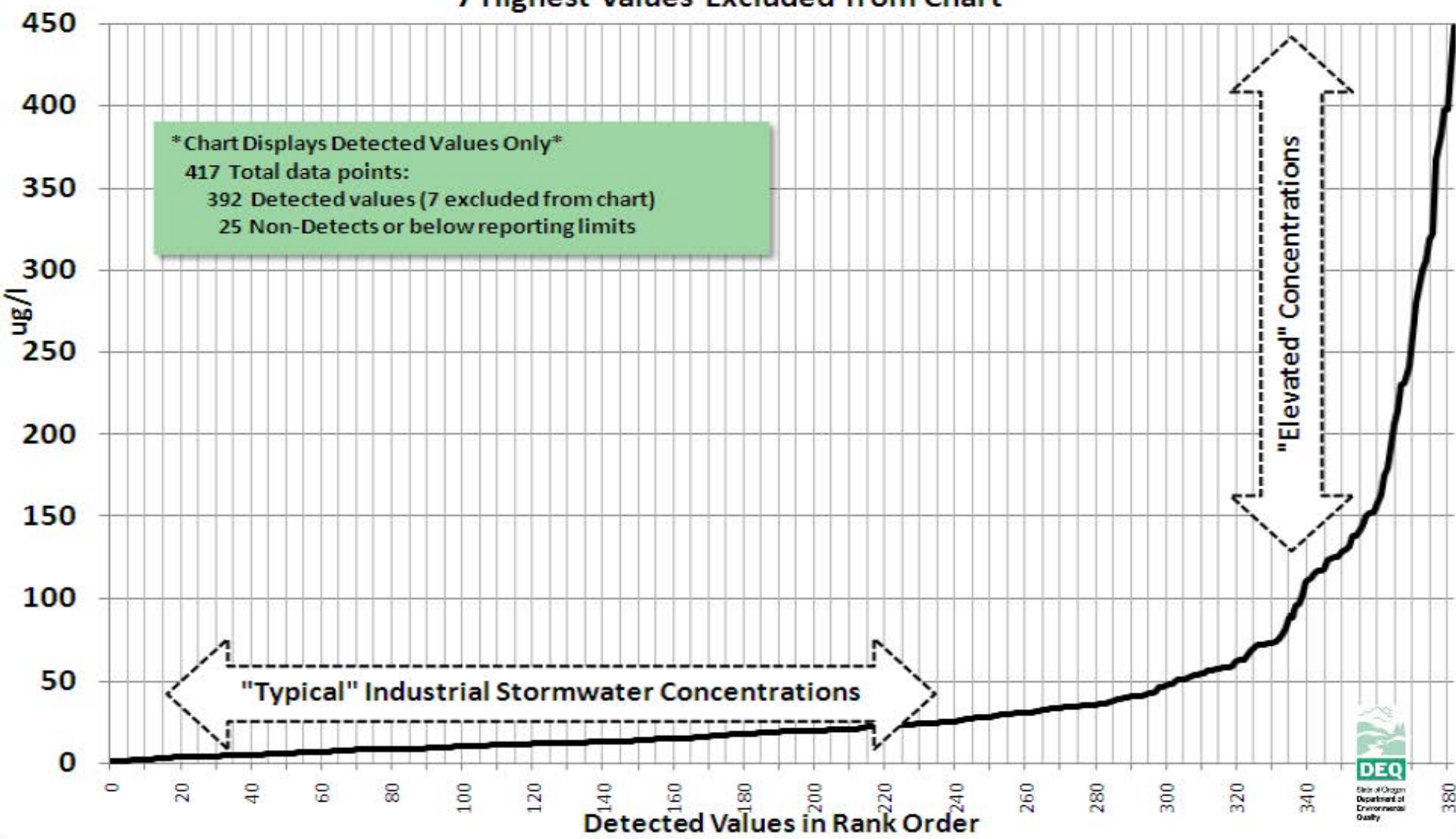
- Schedule sampling events when it is predicted that the following storm event criteria will be met:
 - Antecedent dry period of at least 24 hours (as defined by $<0.1''$ over the previous 24 hours);
 - Minimum predicted rainfall volume of $>0.2''$ per event; and
 - Expected duration of storm event of at least 3 hours.



Source Control Guidance Rank-Order Curves

Stormwater Contaminant X at Portland Harbor Heavy Industrial Sites

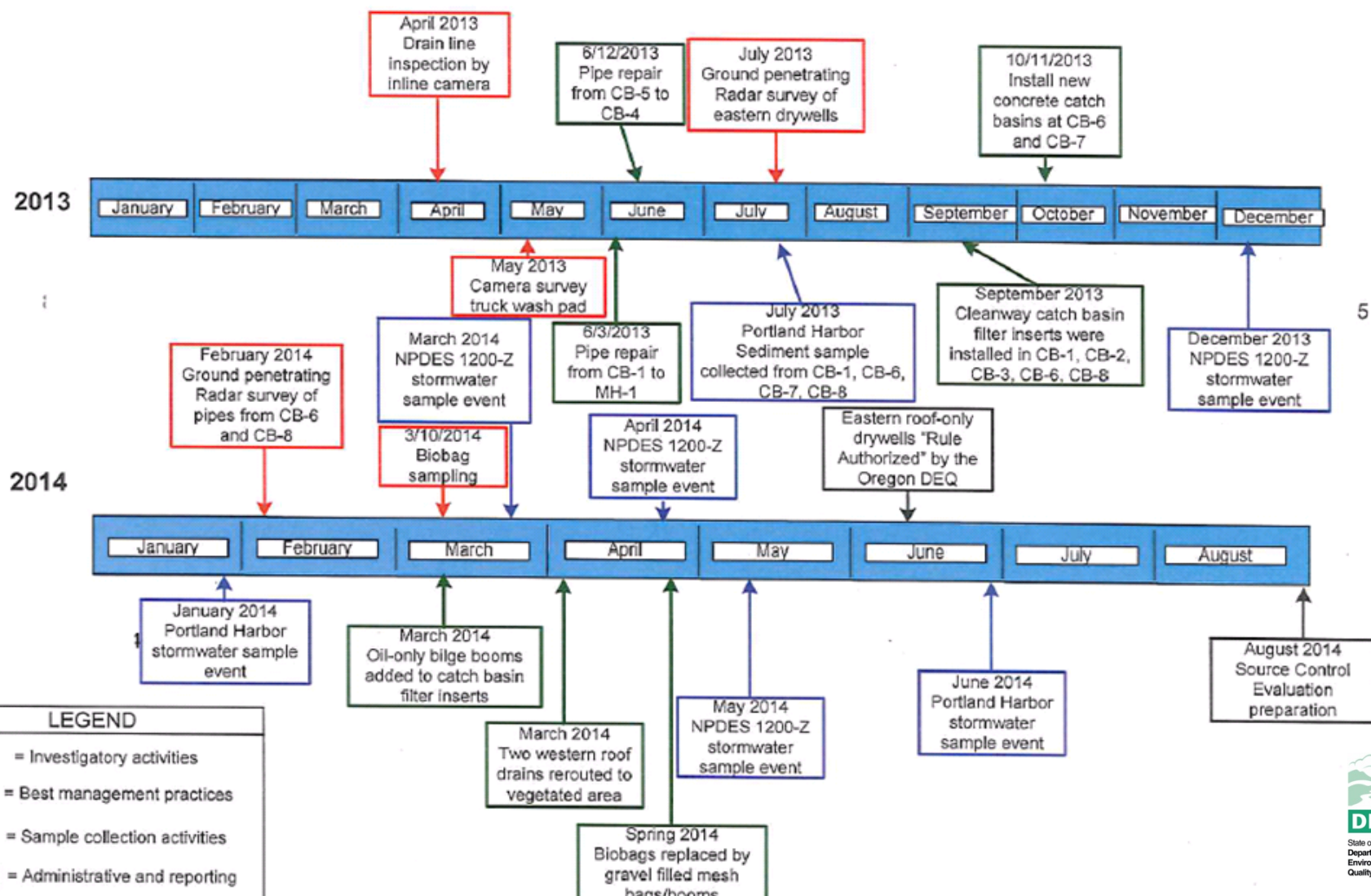
7 Highest Values Excluded from Chart



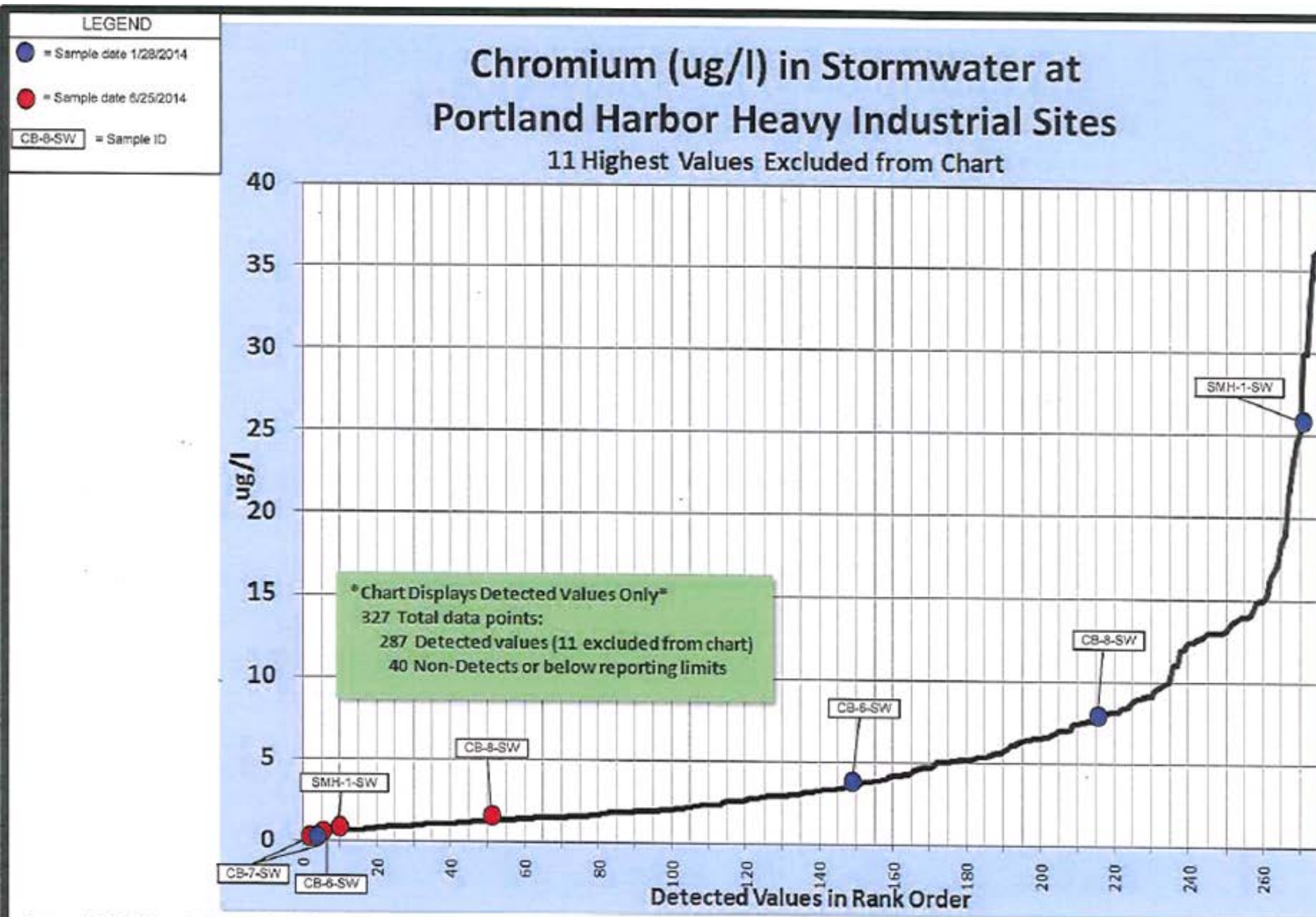
DEQ Guidance Lines of Evidence

- PH SLVs
- Rank-Order Curves
- Presence of Bioaccumulative Chemicals
- Discharges to 303(d) Listed Waterbodies
- Outfall Sediments
- Hydrodynamics and Runoff Volume
- Representativeness of the Samples
- Periodicity of Site Activities
- Future Stormwater Management

Example chronology of sampling & SCMs



Example plot of downward trend



Stormwater Source Control vs 1200Z Permit

Stormwater Source Control Goal

Demonstrate that any legacy or current sources of contaminants are removed or controlled and not transported to the Superfund study area. Sufficient control = sediment in the river will not be recontaminated after the cleanup and in-water receptors are not exposed to unacceptable risk.

CWA Objectives for NPDES

Ultimately, to eliminate discharges of pollution. Practicably, to reduce pollutants in on-going discharges. Allows for iterative reductions to the “maximum extent practicable” using “best available technologies.”



Stormwater Source Control vs 1200Z Permit

Source Control

1200Z Permit

Legacy & current operations

Current industrial activities

Solids & stormwater sampling

Stormwater sampling

4 events w/in 3 hrs (2 w/in 30 min)

4 events – 2 each wet & dry seasons - 2 wks apart

Screening Level Values (risk-based) & Rank-order curves

Benchmarks & reference concentrations - geomeans

Iterative SCM implementation & effectiveness monitoring

SWPCP w/BMPs implementation & corrective actions

Source Control Decision

Permit Renewal every 5 yrs



Stormwater Source Control vs 1200Z Permit

10

1200Z Parameters (for discharges to the Lower Willamette)	1200Z Regulatory Concentration	Portland Harbor SLV		Portland Harbor Rank-order curve "knee"
	mg/L	µg/L	µg/L	µg/L
pH	5.5 – 9.0 S.U.	--	--	--
Total Copper	0.020	20	2.7	~ 60
Total Lead	0.040	40	0.54	~ 30
Total Zinc	0.12	120	36	~ 500
Oil & Grease	10	10000	--	--
TSS	100	100000	--	~ 50000
Total Cadmium	**	**	0.094	~ 0.7
Total Nickel	**	**	16	~ 7
Total Chromium	**	**	100	~ 7
Aldrin	0.003	3	0.00005	--
DDT	0.0011	1.1	0.00022	--
DDT Metabolite (DDE)	0.00001	0.01	0.00022	--
Dieldrin	0.0025	2.5	0.000054	--
Iron	1.0	1000	--	--
Total PCB (Sum of 7 aroclors)	0.002	2	0.000064 (sum of 9 aroclors)	~ 0.3
Aroclor 1016			0.96	--
Aroclor 1221			0.034	--
Aroclor 1232			0.034	--
Aroclor 1242			0.034	--
Aroclor 1248			0.034	--
Aroclor 1254			0.033	--
Aroclor 1260			0.034	--

Stormwater Numbers

- ~170 sites screened for stormwater pathway eval
 - 83 evaluating stormwater pathway for SC (including City OFs & ODOT OFs)
 - 22 SCDs/NFAs

Georegion	Stormwater SC Evaluations	SCDs (a few are NFAs)
Albina	4	0
Pearl	6	4
Swan Island	6	0
St Johns	3	0
Guilds Lake	27	11
Doane Lake/Willbridge	14	4
T-4/International Slip	11	0
Linnton	8	3
Rivergate	2	0

- ~90 NPDES 1200Z or Individual Permits
- ~90 NECs